



Giant Mine Environmental Assessment

IR Response

Round One: Information Request - Environment Canada #06

May 31, 2011

INFORMATION REQUEST RESPONSE

EA No: 0809-001

Information Request No: Environment Canada #06

Date Received:

February 28, 2011

Linkage to Other IRs

Review Board IR #3, #8
YKDFN IR #09

Date of this Response:

May 31, 2011

Request

Preamble:

The proposed frozen block method is aimed at minimizing and eventually eliminating the possible movement of groundwater from the arsenic dust chambers and other storage areas. In section 6.2.8.1, the proponent states that the large number of underground workings is expected to be the primary conduits for any groundwater flow that occurs. The current proposed remediation plan should incorporate long-term secondary mitigation for these possible preferential pathways for groundwater movement. For example, would it be technically feasible to seal off exit pathways (stopes, shafts and other mine workings) below and around the frozen zone to further prevent or minimize groundwater movement within the mine under dewatered and flooded conditions. In other words, even if there was incomplete freezing and contaminated water did escape from the frozen zone; it would not be flowing freely within the workings but would be further confined by features such as adit plugs or backfilled and grouted workings.

Question:

Please describe if there are plans for long-term secondary mitigation for these possible preferential pathways for groundwater movement.

Reference to DAR (relevant DAR Sections)

S.6.2.8.1 Influence of Groundwater

Reference to the EA Terms of Reference

S.3.3 Arsenic Containment





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Summary

Bulkheads currently exist outside of all known openings to each arsenic chamber and stope. Prior to freezing, all drifts passing near to each chamber or stope will be plugged, and the plugs will be frozen as part of the “frozen shell” stage.

Mitigation measures include the installation of additional drift plugs, freeze pipes, or thermosyphons.

Response

The statement paraphrased in the preamble from Section 6.2.8.1 of the Developer’s Assessment Report (DAR) (the large number of un-plugged underground drifts and other mine voids are expected to be the primary conduit for any flow) refers to areas away from the frozen blocks and not through the blocks. Further details regarding the influence of groundwater and thermal loading from open drifts are discussed in the response to Review Board Information Request #3.

All arsenic chambers are currently secured with bulkheads at all known openings to isolate them from the remainder of the mine. Prior to the initial freeze, all drifts outside each bulkhead will be backfilled with water-tight plugs to provide secondary containment and prevent the free movement of groundwater.

In the unlikely event of incomplete freezing, any leak is more likely to occur through an unidentified borehole, or through a crack that develops in the bedrock or a bulkhead. This scenario is discussed in the response to Review Board Information Request #8, which provides an assessment of the risks if the frozen wall does not seal off completely. Any leaks from the wetting of the dust would be collected by the mine water collection system.

Mitigation measures in the event of a leak from the chambers include the installation of additional drift plugs or the installation of additional freeze pipes or thermosyphons to provide additional cooling. Additional drift plugs could be constructed underground or remotely from surface. It is worth noting that a number of well-proven methods exist for plugging drifts and backfilling voids in underground mining.

